

CLAIMS

1. A method of making a semiconductor structure, comprising:
etching an anti-reflective coating layer with an ARC etch plasma
at a pressure of at most 10 millitorr;
5 etching a nitride layer with a first nitride etch plasma having a
first F:C ratio; and
etching the nitride layer with a second nitride etch plasma
having a second F:C ratio;
wherein the first F:C ratio is greater than the second F:C ratio.
- 10 2. The method of claim 1, wherein the etching an anti-reflective
coating layer is performed at a pressure of at most 6 millitorr.
3. The method of claim 1, wherein the etching of the anti-reflective
coating layer comprises performing an overetch.
- 15 4. The method of claim 1, wherein the etching of the nitride layer
with the second nitride etch plasma comprises performing an overetch.
5. The method of claim 1, further comprising a main etch.
6. The method of claim 5, further comprising an overetch.
7. The method of claim 5, wherein the semiconductor structure
comprises at most 10 drips per square centimeter.
- 20 8. The method of claim 5, wherein the semiconductor structure
comprises at most 8 drips per square centimeter.
9. The method of claim 5, wherein the semiconductor structure
comprises at most 1 drip per square centimeter.
- 25 10. The method of claim 1, wherein the ARC etch plasma has a F:C
ratio of at least 4.0.

11. The method of claim 1, wherein the first nitride etch plasma has a F:C ratio of at least 3.8.

12. The method of claim 1, wherein the second nitride etch plasma has a F:C ratio of at most 3.7.

5 13. The method of claim 1, wherein the semiconductor structure has a minimum feature size of at most 1.8 micrometers.

14. A method of making a semiconductor structure, comprising:
etching an anti-reflective coating layer at a pressure of at most 6 millitorr;

10 overetching the anti-reflective coating layer;
etching a nitride layer with a first nitride etch plasma having a F:C ratio of at least 3.8;

etching the nitride layer with a second nitride etch plasma having a F:C ratio at most 3.7; and

15 overetching the nitride layer with the second nitride etch plasma;
wherein the semiconductor structure has at most 1 drip per square centimeter, and has a minimum feature size of at most 1.8 micrometers.

20 15. The method of claim 14, further comprising a main etch and an overetch.

16. A method of making a semiconductor device, comprising:
making a semiconductor structure by the method of claim 1; and
forming a semiconductor device from said structure.

25 17. A method of making a semiconductor device, comprising:
making a semiconductor structure by the method of claim 14;
and
forming a semiconductor device from said structure.

18. A method of making an electronic device, comprising:
making a semiconductor device by the method of claim 16; and
forming an electronic device, comprising said semiconductor
device.

5 19. A method of making an electronic device, comprising:
making a semiconductor device by the method of claim 17; and
forming an electronic device, comprising said semiconductor
device.

10 20. A semiconductor structure, comprising:
a gate oxide;
a polysilicon layer on the gate oxide;
a silicon nitride layer on the polysilicon layer; and
an anti-reflective coating layer on the polysilicon layer;
wherein the semiconductor structure has a minimum feature
15 size of at most 1.8 micrometers and has at most 10 drips per square
centimeter.

21. The semiconductor structure of claim 20, having at most 8 drips
per square centimeter.

20 22. The semiconductor structure of claim 20, having at most 1 drip
per square centimeter.

23. A semiconductor structure, formed by the method of claim 1.

24. A semiconductor structure, formed by the method of claim 14.

25 25. In a method of making a semiconductor structure including
etching an anti-reflective coating layer with an ARC etch plasma, etching a
nitride layer, and etching a polysilicon layer, the improvement comprising:
applying the ARC etch plasma at a pressure of at most 10
millitorr; and

etching the nitride layer with a first nitride etch plasma having a first F:C ratio, followed by a second nitride etch plasma having a second F:C ratio;

wherein the first F:C ratio is greater than the second F:C ratio.